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What is claimed:

- An isolated soluble non-fibrillar amyloid β protein assembly comprising 3-12 amyloid β proteins and having neurotoxic activity in organotypic brain slice cultures from adult animals.
- An isolated amyloid β protein assembly according to claim 1 wherein
 the assembly is a soluble non-fibrillar globular structure with dimensions approximately
 4.9 5.3 nm as measured by atomic force microscopy having a molecular weight of 23-24 kD.
 - 3. An isolated amyloid ß protein assembly according to claim 1 wherein the assembly is a soluble non-fibrillar globular structure with dimensions approximately 5.7 6.2 nm as measured by atomic force microscopy having a molecular weight of 27-28 kD.

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- 4. A method for measuring the vivo effects of the protein assembly of claim 1 comprising:
 - (a) administering the protein assembly of claim to an animal, and
 - (b) conducting the LTP procedure by;
 - (i) administering an electrical simulus and
 - (ii) measuring the cell body spike amplitude over time.
- 5. A method for protecting brain cells against toxicity of amyloid β protein comprising blocking the formation or activity of the

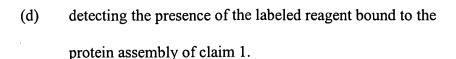
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protein assembly of claim 1.

- 6. A method of treating or preventing Alzheimer's disease and related dementias and memory disorders in human beings by blocking the formation or the activity of the protein assembly of claim 1.
- 5 7. A method for detecting the protein assembly of claim 1 comprising:
 - (a) contacting the test material with 6E10 antibody; and
 - (b) detecting binding of the antibody.
 - 8. A method for detecting the protein assembly as claim 1 comprising:
 - (a) contacting test material with B103 neuroblastoma cells, and
 - (b) measuring morphological changes in said cells.
 - 9. A method for detecting the protein assembly of claim 1 comprising:
 - (a) contacting the test material with brain slice cultures, and
 - (b) measuring brain cell death.
 - 10. A method for detecting the protein assembly as claim 1 comprising:
 - (a) contacting test material with B103 neuroblastoma cells, and
 - (b) measuring increases in fyn kinase activity.
 - 11. A method for identifying compounds that block receptor binding of the protein assembly of claim 1, comprising:
 - (a) mixing test compound with cell culture media after formation of the protein assembly of claim 1.
 - (b) contacting the mixture of 10 (a) with B103 cells or other neuronal cells.
 - (c) adding a labeled reagent that can bind to the protein assembly of claim 1.

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- 12. A method for identifying compounds that block formation of the protein assembly of claim 1, comprising:
- (a) mixing test compound with media before in the procedure to form the protein assembly of claim 1, and
 - (b) contacting the mixture of 10 (a) with B103 cells or other neuronal cells.
 - (c) adding a labeled reagent that can bind to the protein assembly of claim 1.
 - (d) detecting the presence of the labeled reagent bound to the protein assembly of claim 1.
 - (e) test compounds exhibiting more inhibition of receptor binding of
 the protein assembly of claim 1 when the test compound is added before
 the formation of the protein assembly of claim 1 compared with addition
 of test compounds after formation are compounds that block formation
 of the protein assembly of claim 1.